



Fact Sheet #2: Coastlines and Coastal Ecosystems

What's the Situation?

Both climate change and unsustainable tourism are threatening coastlines, coastal ecosystems, and on occasion, MPAs. The tourism industry in Grenada is highly dependent on its coastal environment and is threatened by a number of climate change related issues, including:

- **Sea-level rise:** According to the United Nations, a half meter rise in sea level in Grenada will result in a loss of 60 per cent of beaches.ⁱ Current projections are that sea level rise of 1 meter or more in the Caribbean will occur by 2100, and major coastal “defense” projects (such as sea walls, detached breakwaters, modification of drainage systems, beach filling, wetland/mangrove/reef restoration and creation, etc.) are required to protect hundreds of kilometers of coastlines.ⁱⁱ A business-as-usual scenario will cause significant relocation of people and infrastructure.
- **Intensified Storms:** As tropical storms move across warm water, they gather energy and strike with much greater force, causing loss of coral, mangroves, sand, etc.ⁱⁱⁱ They also contribute to erosion of the shoreline.
- **Coral Destruction:** Healthy reefs in the Caribbean are increasingly rare. The IUCN reports that “average live coral cover on Caribbean reefs has declined to just 8% of the reef today, compared with more than 50% in the 1970s.”^{iv} Increased air and sea temperatures result in coral bleaching, and rising amounts of CO₂ causes ocean acidification that also damages reefs. Loss of reefs contribute to decreased fish stock, which is harmful to local industry and requires increased imports of seafood.

Negative Tourism Impacts:

These climate change related phenomena are deeply affecting Grenada's coastal tourism industry. For instance, from Hurricane Ivan in 2004, 60% of jobs connected to ecotourism and heritage tourism were lost, as well as large parts of the reef in front of Grand Anse Beach - Grenada's prime tourism area.^v CARIBSAVE estimates that a “1 meter of sea level rise will put 73% of Grenada's tourism at risk, increasing to 86% at 2 meters.”^{vi}

Unsustainable tourism practices further exacerbate these climate change impacts, and create new challenges. The effects of sea level rise and storm surges are made worse by erosion from ocean front development, dredging, and sand mining. Tourism development projects frequently required the removal of mangroves, sea grasses, and corals, which act as natural buffers to storm surges. Coastal resorts and cruise lines have gained notoriety for dumping sewage directly into the water, while too often boaters, divers, and snorkelers are damaging coral reefs. The large numbers of tourists from cruise ships and large resorts without proper monitoring is causing destruction in fragile coastal and island ecosystems. In addition, coral is frequently sold as jewelry and souvenirs in tourist shops in the Caribbean.

Tourism Solutions:

On the other hand, the tourism industry, whose long term survival depends on healthy ecosystems and landscapes, is well-poised to adapt and mitigate coastal climate change impacts. Here are a few examples of positive initiatives from the Caribbean and elsewhere:

- **Coral Restoration:** Reef restoration or replanting is becoming more common and is showing considerable success. Some of these initiatives are now being run as recreational activities by hotels, tour operators, and dive shops. For instance, the PUNTACANA Ecological Foundation in the Dominican Republic, the conservation arm of Puntacana Resort & Club, is combatting coral erosion by restoring the fragile ecosystem near the resort. Divers take samples of live coral and transplant them in coral nurseries where, with time and optimal conditions, they grow. Divers then replant the coral from the nursery back onto damaged and dying coral reefs. Experienced divers visiting Punta Cana are able to achieve a “Coral Reef First Aid Distinctive Specialty” certification to help in the effort as well. In total, more than 1000 meters of coral has been transplanted back on the reef by people working diligently to save the reefs.^{vii}
- **Artificial Reefs:** Grenada’s Underwater Sculpture Park, created in 2006 by the internationally renowned sculptor Jason deCaires Taylor, features dozens of sculptured figures set within a marine protected area (MPA). The area, just off Grenada’s coastline, had been damaged by storm surges, and the marine habitat was suffering. The cement figures are designed to serve as an artificial reef, attracting corals, increasing marine biomass, and aggregating fish species, while also diverting tourists away from fragile natural reefs and thus providing space for natural rejuvenation. The Park is bringing international attention and foreign exchange to Grenada, and has created new local jobs as guides, boatmen, and dive instructors.^{viii}
- **Mangrove Restoration:** A Mangrove Learning Centre in Pangandaran, Indonesia, teaches school children and their families about mangrove ecosystems. The Centre is also a popular tourist attraction, providing information about the ecosystem and opportunities to plant tree saplings as part of a Green Energy Tour. Since 2010, around 35,000 trees have been planted in a mangrove conservation area of more than 17 hectares, with a survival rate of 90%. More than 2000 visitors have participated in this programme, while carbon emissions have been reduced by several hundred tonnes.^{ix}
- **Marine Protected Areas:** Today there are over 500 MPAs in the Caribbean,^x which are helping to protect coastal assets. Bonaire Marine Park in the Caribbean is one of the first self-funding protected areas and is supported entirely from tourism revenue.^{xi} Grenada currently has three established MPAs and has agreed through the Caribbean Challenge initiative to protect 20% of its marine assets by 2020.^{xii}

ⁱ United Nations, “Did You Know?” 2014, <http://www.un.org/en/events/islands2014/didyouknow.shtml>

ⁱⁱ Hugh Sealy, “Potential Impacts of Climate Change on Tourism in the Caribbean,” (Presentation at the Center for Responsible Travel’s 3rd Symposium for Innovators in Coastal Tourism, St. George’s, Grenada, July 10, 2014)

ⁱⁱⁱ IPCC, “Climate Change 2007: Impacts, Adaptation, and Vulnerability,” 2007, <http://www.ipcc.ch/pdf/assessment-report/ar4/wg2/ar4-wg2-chapter16.pdf>

^{iv} Huffington Post, “Caribbean Coral Reefs in Sharp Decline, Says IUCN,” September 7, 2012, http://www.huffingtonpost.com/2012/09/07/caribbean-coral-reefs_n_1864998.html

^v Intergovernmental Panel on Climate Change (IPCC), “Climate Change 2007: Working Group II: impacts, Adaptation and Vulnerability”, Section 16.4.6, http://www.ipcc.ch/publications_and_data/ar4/wg2/en/ch16s16-4-6.html

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- vi CARIBSAVE, "Climate Change Risk Profile for Grenada," March 2012, www.caribbeanclimate.bz
- vii Puntacana Resort & Club, "Coral Restoration: Saving the Beaches of the Dominican Republic," July 25, 2014, <http://www.puntacanablogs.com/blog/coral-restoration-saving-the-beaches-of-the-dominican-republic>
- viii Grenada Underwater Sculpture Park, 2013, <http://grenadaunderwatersculpture.com/sculptures/>
- ix International Climate Initiative, "Ecotourism and Mangrove Adoption in Pangandaran," November 11, 2013, <http://www.international-climate-initiative.com/en/news/article/ecotourism-and-mangrove-adoption-in-pangandaran/>
- x UNEP, "National and Regional Networks of Marine Protected Areas: A Review of Progress," 2012, http://www.unep.org/regionalseas/publications/otherpubs/pdfs/MPA_Network_report.pdf
- xi World Resources Institute, "Marine Protected Areas of the World," September 2008, <http://www.wri.org/resource/marine-protected-areas-world>
- xii Global Island Partnership, "From Commitment to Action," 2013, <http://glispa.org/commitments/11-commitments/33-caribbean-challenge-initiative-cci>